

## Notes on breeding *Tephrosia bistortata* and hybrid *T. bistortata* × *T. crepuscularia* (with two plates).

By E. A. COCKAYNE, F.E.S., F.L.S.

As a supplement to the interesting hybridisation experiments recorded by Mr. Tutt in the *Transactions of the Entomological Society of London*, 1898, the following notes may be of value. From a ♀ of *Tephrosia bistortata* (*crepuscularia*) obtained in Perthshire in April, 1907, I bred a small number of imagines in March and April, 1908, all of which had the deep chocolate lines and bold speckling typical of this race. Two of the *bistortata* paired, and a ♂ *bistortata*, a specimen with white ground colour, and not much suffused or speckled, paired with a small ♀ *crepuscularia* (*biundularia*), bred from Epping Forest ova. The ova from both pairings proved fertile, and a considerable number of the resulting larvæ pupated. The pupæ were kept in an unheated room.

The brood of pure *T. bistortata* emerged in two portions; nine, all ♀s, appeared between July 25th and 29th, 1908, and twelve, six ♂ and six ♀, between February 12th and March 23rd, 1909. The insects of both parts of the brood were large, and differed but little in colour and markings, none resembling the small white, feebly-marked, second-brood English *T. bistortata*.

The ♂s were much suffused with dark brown, though the colour was not as dark as in the finest wild Perthshire specimens.

The ♀s had the dark markings paler and less rich than is usual, and in some the ground colour was suffused with pale brown. All, but especially the summer specimens, look rather dull and faded.

The interest of this brood lies in the fact that *T. bistortata* is normally single-brooded in Perthshire, and that when a second brood is artificially produced, it resembles the first, and it is not totally different as in the English second brood.

The brood of hybrids also emerged in two portions, sixteen, all ♀s, between July 12th and September 25th, 1908, and ten, eight ♂s and two ♀s, between December 17th, 1908, and February 6th, 1909. The summer and autumn specimens were all small and pale, closely resembling the ♀ parent, while the winter and spring specimens were larger and darker. Though one ♂ is as dark as the ♀ parent, they resemble *T. crepuscularia* more than *T. bistortata*.

The wings look more pointed, and the elbowed line is more oblique, with but little dark shading outside it; the speckling is finer, and the whole appearance neater than that of Perthshire *T. bistortata*.

The ♀s, though small, are in colour and markings more like *T. crepuscularia* than *T. bistortata*. Owing to the long, drawn-out period of emergence, I was not able to attempt any further crossing between the hybrids *inter se*, or between a hybrid and a *T. bistortata*.

### EXPLANATION OF PLATE XI.

*Tephrosia bistortata* from Perthshire ova, two sections—(1) emerged July, 1908; (2) emerged February-March, 1909. Third column captured specimens.

### EXPLANATION OF PLATE XII.

Parents of crossing of *Tephrosia bistortata* × *Tephrosia crepuscularia*. Hybrid progeny of this crossing, two sections—(1) emerged July-September, 1908; (2) emerged December, 1908-February, 1909.